

## Use of Nepafenac with conventional topical antibiotic-steroid combination in post cataract surgery regimen

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### Abstract

**Purpose of study:** This study was conducted to evaluate the role of Nepafenac in reducing the inflammation and macular edema after Phacoemulsification along with conventional antibiotic-steroid therapy.

**Materials and Methods** This prospective randomized control trial study was conducted from Jan 2019 to Dec 2019 on 500 patients with senile cataract undergoing Phacoemulsification. Out of 500 patients 223 patients were males while 277 were females. After Phacoemulsification the patients were divided into two groups. Group A with 250 patients was given antibiotic-steroid combination while Group B with 250 patients was given nepafenac along with antibiotic-steroid combination for a period of 7 weeks postoperative. Serial examination was conducted after Phacoemulsification including slit lamp examination with biomicroscopy, visual acuity testing, Tonometry, and finally OCT on last visit.

**Results** The two groups were compared with regard to visual acuity, intraocular pressure, anterior chamber reaction and cells and central macular thickness. The best corrected visual acuity was 6/6-6/9 in 90% in group A while 96% in group B at final visit. Inflammatory cells and flare in the anterior chamber were nearly equal in both groups at 1<sup>st</sup> postoperative day ( $P>0.05$ ), but there was significant statistical difference in the same at 2<sup>nd</sup> and 3<sup>rd</sup> follow up ( $P<0.05$ ). At the last follow up that is 6<sup>th</sup> postoperative week again no statistical difference was found in the cells and flare in the anterior chamber ( $P>0.05$ ) in both groups. The intraocular pressure spiked in group A in 8(3.2%) patients at 6<sup>th</sup> follow up as compared to 2(0.8%) patients in group B. The mean central macular thickness was higher in group A at 6<sup>th</sup> week as compared to Group B.

**Conclusion:** Nepafenac as an addition to topical steroids have a beneficial effect on reducing immediate postoperative inflammation. Reducing the frequency of steroids with nepafenac also decreases the chances of steroid response glaucoma. Finally nepafenac poses its additive effect by reducing the chances of postoperative macular edema.

**Key words:** Phacoemulsification, Steroids, Nepafenac, inflammation, central macular thickness.

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### Introduction

Cataract is the commonest cause of reversible blindness not only in Pakistan but all over the world<sup>1</sup>. The only definitive treatment to cataract is surgery<sup>2</sup>. For a good visual outcome not only the surgical procedure be fine but also postoperative management need to be on the target. The target after cataract surgery is to control infection<sup>3</sup> and inflammation<sup>4</sup>. Quinolones are the gold standard for prevention of infection<sup>5</sup> while prednisolone and dexamethasone used to control postoperative inflammation<sup>6</sup>.

Steroids work by inhibition of phospholipase A2, thus prohibiting release of Arachidonic acid<sup>7</sup>. The inflammation reducing property of steroids is associated with the risk of raising intraocular pressure<sup>8</sup>.

Adapting the advanced procedure of small incision and modern phaco techniques have led to less chances of postoperative inflammation<sup>10</sup>. Despite this fact postoperative macular edema is still a major factor responsible for decrease visual outcome after cataract surgery<sup>11</sup>. Thus along with steroids which reduces postoperative inflammation another add deem useful to achieve good visual outcome.

Nepafenac an ANSAID inhibits cyclooxygenase, an enzyme needed for the production of Prostaglandins. Due to the mode of action of nepafenac it has proved beneficial in reducing postoperative inflammation and reducing cystoid macular edema<sup>12</sup>.

We conducted this study to compare the additive effects of Nepafenac with

conventional antibiotic-steroid combination after cataract surgery.

### **Materials and Methods:**

This was a prospective randomized control study conducted at department of Ophthalmology, Peoples University of medical and health sciences Nawabshah. A total of 500 patients with senile cataracts were sorted out from outpatient department and planned for Phacoemulsification with foldable intraocular lens implantation. After a detailed preoperative work up surgery was carried out. Patients with uneventful Phacoemulsification with foldable IOL implantation were included in the study. Patients with glaucoma, uveitis, Retinitis pigmentosa, complicated cataract, corneal opacity, trauma, Macular pathology and Diabetes were excluded from the study. The patients were than randomly categorized into two groups assigned A and B.

Group A was given conventional protocol regimen of Topical Moxifloxacin and Prednisolone one hourly. While Group B was started on Topical Moxifloxacin one hourly, Prednisolone two hourly and Nepafenac twice a day. The patients were followed on 1<sup>st</sup> postoperative day, at the end of first week, 2<sup>nd</sup> week, 3<sup>rd</sup> week and finally 6<sup>th</sup> week. The frequency of moxifloxacin and prednisolone was reduced to QID at 3<sup>rd</sup> week and stopped at 6<sup>th</sup> week in both groups. At each followup patients underwent visual acuity examination, slit lamp examination/ biomicroscopy, and Tonometry. OCT for macular thickness was performed on final visit.

Evaluation for anterior chamber

Anterior chamber cells	Group A	Group B
0	187	215
1	56	34
2	07	01
3	00	00
Total	250	250

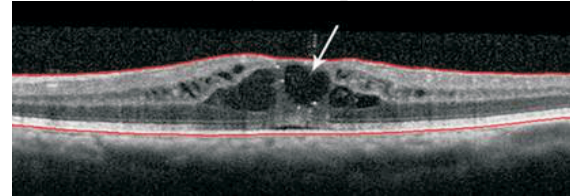
inflammation was conducted by slit lamp examination with following markers<sup>13</sup>:

1. Cells in the anterior chamber (slit-lamp examination, using a 1 mm slit beam):
  - a. Grade 0: None.
  - b. Grade 0.50: 1–5 cells.
  - c. Grade 1: 5–15 cells.
  - d. Grade 2: 15–25 cells.
  - e. Grade 3: 25–50 cells.
  - f. Grade 4: >50 cells.
2. Flare in the anterior chamber (slit-lamp examination, using a 1 mm slit beam):
  - a. Grade 0: None.
  - b. Grade 1: Faint.

- c. Grade 2: Moderate (iris/lens details clear).
- d. Grade 3: Marked (iris/lens details hazy).
- e. Grade 4: Intense (fibrin/plastic aqueous).

Post operative cystoids macular edema was measured by OCT with one of following features:

1. Subfoveal thickening.
2. Cystic spaces in the outer plexiform and outer nuclear layers in perifoveal zone.



Data was analyzed on SPSS software version 2. P value of less than 0.05 was considered significant.

### **Results:**

Out of 250 patients of Group A, 122 were males and 128 were females, while 101 were males and 149 were females in group B. The mean age of overall patients was 62±3 years.

The best corrected visual acuity (BCVA) in group A at 1<sup>st</sup> follow up was 6/6-6/9 in 73% cases while 69% in group B. Eventually the BCVA improved to 6/6- 6/9 in 90% cases of group A, while 96% in group B at 6<sup>th</sup> week follow up (Table 1).

**Table 1: BCVA of Groups**

BCV	1 <sup>st</sup> Post op .day	1 <sup>st</sup> post op .week	2 <sup>nd</sup> postop p. week	3 <sup>rd</sup> postop p. week	6 <sup>th</sup> post op .week
Group A	73%	79%	83%	87%	90%
Group B	69%	76%	88%	91%	96%

On slit lamp examination the inflammation was measured by two parameters i-e cells and flare.

The cells were in the range of grade 0 & 1 in most of the cases in both groups at 1<sup>st</sup> postoperative day. Table 2

**Table 2: Cells grading in anterior chamber at 1<sup>st</sup> postop day**

**Table 3: Cells grading in anterior chamber at 1<sup>st</sup> postop week**

**Table 3: Cells grading in anterior chamber at 6<sup>th</sup> postop week**

In 92.4% cases of group A there were no cells in anterior chamber at the last follow as compared to 99.6% of group B.

**Table.4: Flare in anterior chamber at 1<sup>st</sup> postop. day**

Ant. Chamb. flare	Group A	Group B
0	201	205
1	38	32
2	11	13
Total	250	250

**Table.4: Flare in anterior chamber at 1<sup>st</sup> postop. week**

Ant. Chamb. flare	Group A	Group B
0	211	236
1	36	13
2	03	01
Total	250	250

**Table.4: Flare in anterior chamber at 6<sup>th</sup> postop. week**

Ant. Chamb. flare	Group A	Group B
0	243	247
1	06	03
2	01	00
Total	250	250

Anterior chamber cells	Group A	Group B
0	157	199
1	77	44
2	13	06
3	03	01
Total	250	250

There was no flare in 80.4% of cases of group A at 1<sup>st</sup> postop day in contrast to 82% of group B(p>0.05).

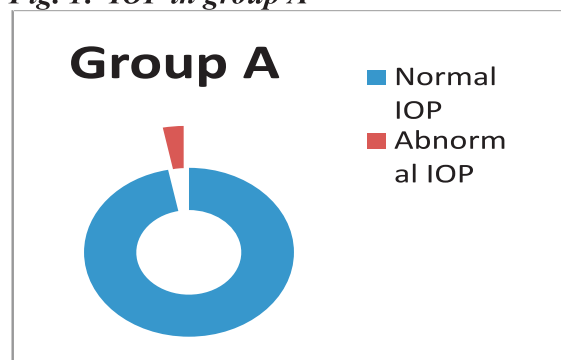
Similarly there was no flare in 84.4% of group A at the end of 1<sup>st</sup> post op week as compared to 94.4% of group B which was statistically significant (p<0.05).

At the last follow up there again was no statistical difference in between two groups regarding the grade of flare.

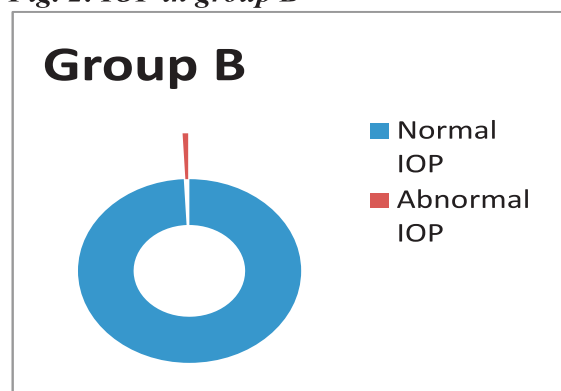
The intraocular pressure (IOP) was monitored throughout the follow up period.IOP spiked in 8(3.2%) cases in group A as compared to 2(0.8%) patients in group B. This was correlated to the greater frequency of using steroid drops in group A as compared to group B.(Fig 1,2)

Anterior chamber cells	Group A	Group B
0	231	249
1	18	1
2	1	0
3	0	0
Total	250	250

**Fig. 1: IOP in group A**

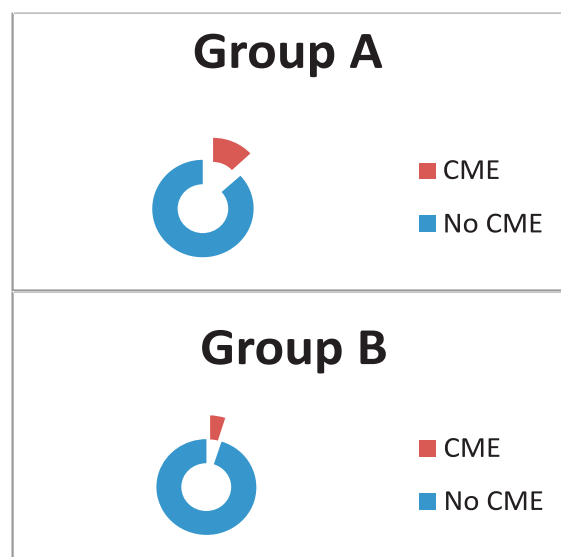


**Fig. 2: IOP in group B**



Optical coherence tomography(OCT) was done at last follow up in all cases to look for cystoids macular edema(CME).

Cystoid macular edema was found to be more prevalent in Group A 33(13.2%) Vs 12(4.8%) Group B.(Fig 3, 4)



**Fig 3, 4:CME in group A and B**

**Discussion:**

The outcome of cataract surgery depends upon the work up done before it and the plan adapted according to those guidelines. Prior to surgery it is very essential to mark the high risk patients. They include patients with history of Diabetes, macular disease, glaucoma, vein occlusion, uveitis, and retinitis pigmentosa. The high risk patients react to any surgical insult and therefore trigger a severe inflammatory reaction. Inflammation in the eye then leads to rise in intraocular pressure and cystoid macular edema.

In the patients without high risks even show inflammatory reaction. Phacoemulsification with foldable IOL implantation carries 2 to 12 % chances of inflammation<sup>14</sup>. It is therefore important to have a postoperative treatment plan that minimizes not only postoperative Infection but also inflammation. Steroids have long been used conventionally to reduce postoperative inflammation. With the advent of Nepafenac an NSAID, the treatment options have been revolutionized. Our study actually was a modification of our conventional postoperative treatment protocol.

Ninety six percent of our cases with concomitant Nepafenac with steroids used postop. achieved V/A of 6/6-6/9. This was in comparison to a similar study by El Gharbhawy SA who found no statistical difference in visual outcome by the addition of Nepafenac to steroids<sup>15</sup>.

In our study add on Nepafenac reduces inflammation in early to mid postoperative period but there is no significant difference at 6<sup>th</sup> postop. Week. In a study carried out by Zaczek et al who used dexamethasone instead of prednisolone deduced that nepafenac has a positive effect on reducing postoperative inflammation<sup>16</sup>.

There are still other studies which prove that Nepafenac can be used alone instead of steroids to reduce postoperative inflammation<sup>17,18</sup>.

Apart from the potent anti inflammatory activity of steroids, they also carry a risk of increasing the intraocular pressure. These patients are called steroid responders and their number can rise to 1/3<sup>rd</sup> of the population though the response is not same in all<sup>19</sup>. The IOP returns to normal level within a few days of quit of steroids<sup>20</sup>. In our study an add of Nepafenac with reduced frequency of topical steroids as compared to steroids alone shows 0.8% IOP spikes in gp B as compared to 3.2% cases with IOP spikes in gp A. This was in accordance with study carried out by Line kessel et al who

also found an increase in IOP in steroid users' vs Nsaids users<sup>21</sup>.

Cystoid macular edema(CME) is one of the commonest complication of cataract surgery. Though it is self limiting in most cases but sometimes it can lead to permanent decrease in vision that is difficult to treat. The incidence of OCT proved cystoid macular edema after cataract surgery varies between 3-41%<sup>22,23</sup>. Our study showed 13.2% prevalence of CME in group A vs 4.8% in group B, which signifies the beneficial effect of Nepafenac in reducing postoperative cystoid macular edema.

**Conclusion:**

It was concluded that addition of Nepafenac to the conventional antibiotic-steroid combination after cataract surgery improves visual outcome.

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